

19. INTERTIDAL ECHINODERMATA OF BOMBAY<sup>1</sup>*(With two plates)*

The taxonomy of echinoderms in Indian waters has attracted attention of scientists since the last seventy years. The collections of the Indian Marine Survey Ship 'Investigator' and those of the Indian Museum have been dealt with by Wood-Mason & Alcock (1891), Alcock (1893), Anderson (1894), Koehler (1898-1927). Koehler & Vaney (1905, 1908), and A. H. Clark (1909-1932). Bell (1886, 1887), Doderlein, Pearson (1903), Chadwick (1904), Herdman (1904), and H. L. Clark (1915) have published several reports on the echinoderms of Ceylon. Duncan & Sladen (1889), Carpenter (1889), and Brown (1910) have worked on the echinoderm fauna of Mergui Archipelago. Bell has described the echinoderms of the Andamans (1887), Bengal (1888), Tuticorin (1888), and the Laccadives and Maldives (1902). Lastly, Thurston (1887) and Gravely (1927) have worked on the echinoderms of Rameswaram and Krusadai respectively.

The echinoderm fauna of the west coast of the Indian subcontinent however, has not received much attention in the past, except for the records by Kurian (1953) of the echinoderms of Travancore (south India). The vast area north of this up to the Persian Gulf has remained unexplored, except for stray records of a few specimens from Karachi, Honavar, and Mangalore by Koehler (1927), and for the work of Patil (1953) at Karwar. The latter has, however, identified most of the specimens only up to their genera. It was, therefore, decided to make a representative collection of echinoderms from Bombay.

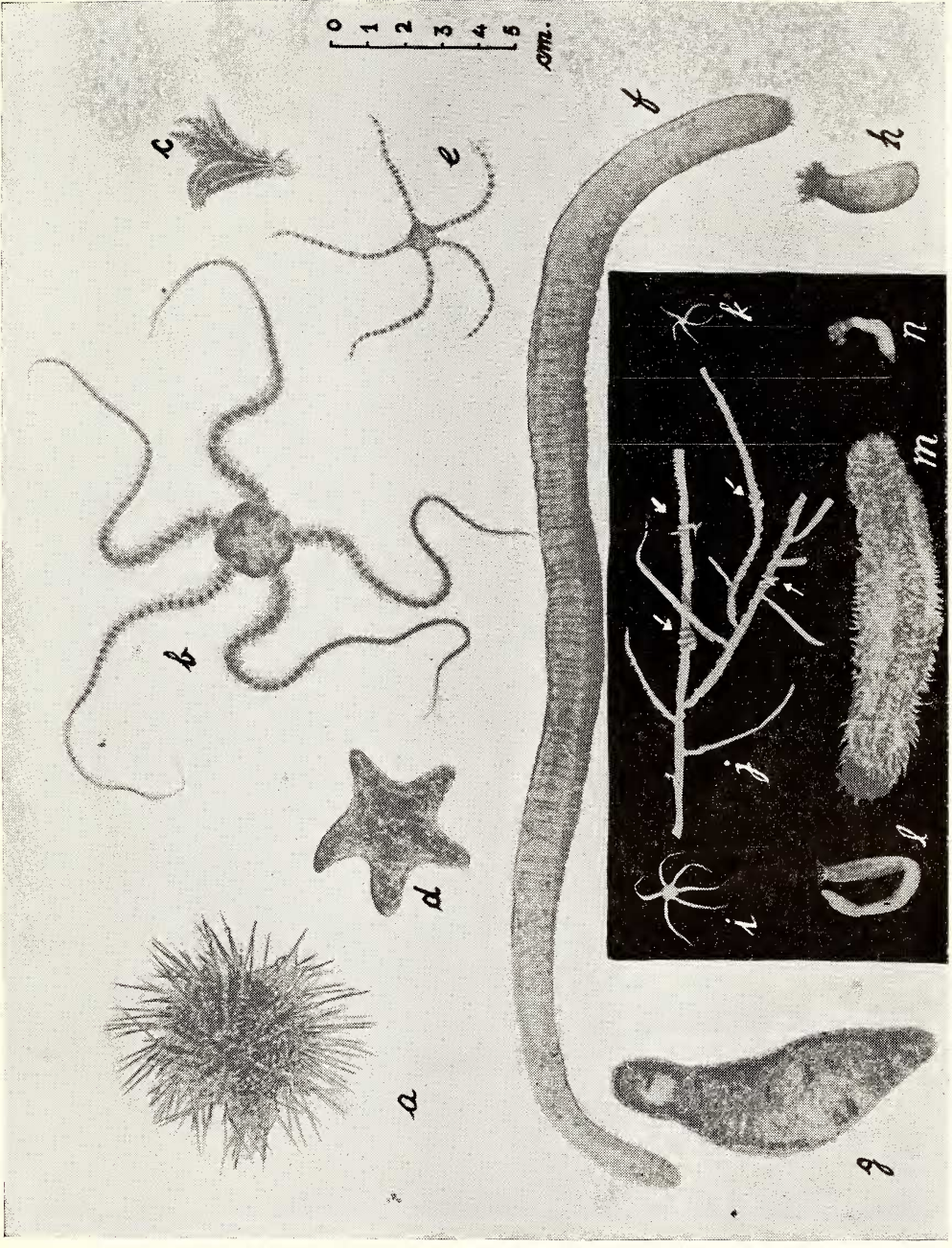
Collections were confined to the inter-tidal zone at various parts along the foreshore in Greater Bombay, viz. Cuffe Parade, Chowpatty, Worli, Mahim, Danda, and Versova. They were also extended to Manori which, although not within the limits of Greater Bombay, was included as it harbours large numbers of feather-stars, which were elsewhere collected only occasionally.

A total of 16 species, belonging to seven different orders and 10 families, comprises the present collection. None of these has so far been recorded from Bombay. Moreover, the species *Amphipholis*

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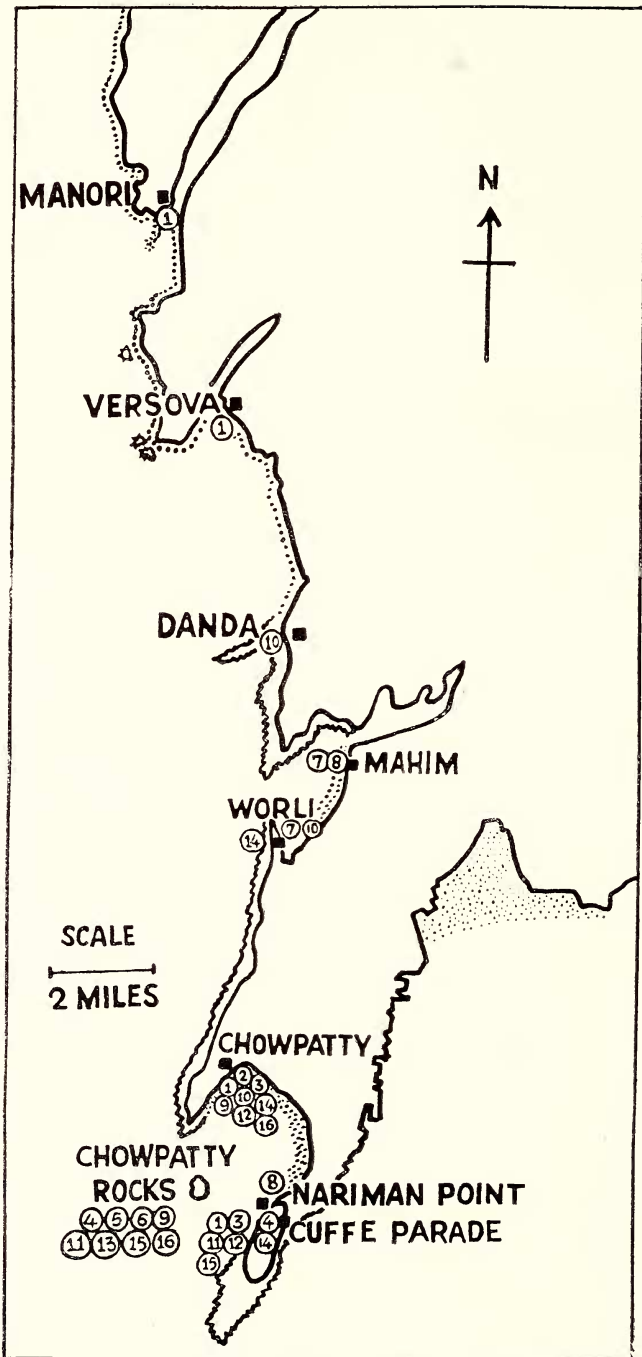
<sup>1</sup> The Echinodermata are characterized by radial symmetry, a calcareous exoskeleton in the form of plates or spicules usually beset with tubercles or spines, which give the phylum its name. Locomotion is by tube-feet. They are marine forms without exception, and none are colonial. They comprise the starfishes, sea urchins, sea cucumbers, brittle stars, and feather stars.—EDS.

Communicated by the Director of Fisheries, Maharashtra State.



(a) *Temnopleurus torenumaticus*; (b) *Macrophiothrix aspidota*; (c) *Lamprometra palmata palmata*; (d) *Asterina lorioli*; (e) *Ophiothela dubia*; (f) *Anapta gracilis* (?); (g) *Holothuria pardalis*; (h) *Athyone* sp.; (i) *Ophiactis savignyi*; (j) *Ophiothela danae*, on a sea-fan; (k) *Amphipholis squamata*; (l) *Protankyra* sp.; (m) *Actinocucumis typica*; (n) *Thyone confjugens*

Specimen (l) has got shrunk during preservation and grows as large as specimen (f).



Map of Bombay showing localities where collections were made. The numbers correspond to those against the names in the systematic list.



*squamata*, *Macrophiothrix aspidota*, and the genus *Athyone* have not so far been recorded from India.

It will be seen from the following list that some of the forms have not been determined up to the species, due to difficulties experienced during preservation and identification, and due to the rarity of some species.

For example, one of the species of Cucumariids cannot be positively identified as it appears to have none of the ordinary skin spicules, although the curved rods and end plates in the tube feet and the spicules in the tentacles are present. It has been referred to the subfamily Thyoninae from the mosaic-like calcareous ring inside the introvert with long posterior prolongations. It appears to be allied to *Athyone transitoria* (Vaney), known from a single specimen 16 mm. long in the western Indian Ocean, which, too, has very few spicules.

One of the forms of *Thyone* also cannot be identified up to the species, as its small size precludes determination of the form of the calcareous ring.

Nor are the authors sure about the species of *Protankyra*, in which there are a number of Indo-Pacific species with very similar spicules.

The specimens of *Anapta* in the present collection resemble *Anapta gracilis*, but differ from the latter in having only four, instead of five, pairs of digits on the tentacles.

Some of the specimens of *Ophiactis savignyi* have less than the usual six arms; also, there is only one distal oral papillar on each side.

## SYSTEMATICS

### Subphylum PELMATOZOA

#### Class CRINOIDEA

#### Order ARTICULATA

#### Suborder Comatulida

#### Family Mariametridae

- (1) *Lamprometra palmata palmata* (J. Müller)  
Clinging to stones, sea-fans, etc.

### Subphylum ELEUTHEROZOA

#### Class HOLOTHURIIDAE

#### Order ASPIDOCHIROTA

- (2) *Holothuria pardalis* Selenka  
Collected from mud under stones.

Order DENDROCHIROTA

Family Cucumariidae

- (3) *Actinocucumis typica* Ludwig  
Collected from mud under stones.
- (4) *Athyone* sp.  
Collected from mud under stones.
- (5) *Thyone conjugens* (Semper)  
Collected from mud under stones.
- (6) *Thyone* sp.  
Collected from mud under stones.

Order APODA

Family Synaptidae

- (7) *Protankyra* sp.  
Lying fully exposed on mud.
- (8) *Anapta gracilis* ?  
Lying fully exposed on mud.

Class ECHINOIDEA

Subclass REGULARIA

Order DIADEMATOIDA

Suborder Camarodonta

Family Temnopleuridae

- (9) *Temnopleurus toreumaticus* (Leske)  
Collected from mud under stones, algae, etc.

Class ASTEROIDEA

Order SPINULOSA

Family Asterinidae

- (10) *Asterina lorioli* Koehler  
Collected from mud under stones.

Class OPHIUROIDEA

Order OPHIURAE

Family Amphiuridae

- (11) *Amphipholis squamata* (Delle Chiaje)  
Collected from mud under stones.

Family Ophiactidae

- (12) *Ophiactis savignyi* (Müller & Troschel)  
Collected from crevices of sponges.
- (13) *Ophiactis* sp.  
Collected from rock crevices.